

Claims

What is claimed is:

1. A method for initiating retransmission of frames comprising:
 - a) detecting a failed attempt to transmit a frame at a physical layer of a receiver;
 - b) sending a message from the physical layer of the receiver to a link control layer of the receiver to indicate the failed attempt to transmit a frame has been detected; and
 - c) upon receipt of the message, sending a retransmission message from the link control layer of the receiver, the retransmission message configured to cause a sender to retransmit data associated with the frame.
2. The method of claim 1 wherein the detecting step further comprises receiving at least a portion of the frame and determining at least a portion of the data associated with the frame is either unrecoverable or corrupted.
3. The method of claim 1 wherein the link control layer implements a Radio Link Protocol (RLP) using an RLP entity associated with an application.
4. The method of claim 3 wherein the frame is a physical layer frame encapsulating data represented by an RLP frame and the sending step further comprises generating the retransmission message to include identification for one of the group consisting of a recently received RLP frame and recently received data such that the sender can identify data or an RLP frame to retransmit.
5. The method of claim 1 wherein the frame is a physical layer frame, the method further comprising:
 - a) receiving the retransmission message at a link control layer of the sender;

- b) determining data or a link control layer frame to retransmit; and
 - c) retransmitting the data or link control layer frame requiring retransmission.
- 6. The method of claim 1 wherein the message is a primitive indicative of a failed attempt to receive frames in the physical layer.
- 7. The method of claim 1 wherein retransmission message is an acknowledgement message.
- 8. The method of claim 1 further wherein the frame is a physical layer frame, the method further comprising:
 - a) sending link control layer frames from the sender over a wireless communication channel to the receiver via physical layer frames from the sender;
 - b) setting a timer upon transmitting each of the link control layer frames from the sender; and
 - c) resetting the timer upon confirmation the link control layer frames were received or a subsequent link control layer frame is sent.
- 9. The method of claim 8 wherein when a timer for one of the link control layer frames expires, sending one of the group consisting of a request message to the link control layer of the receiver from the sender requesting identification of a last portion of data or link control layer frame received by the link control layer of the receiver and data or a link control layer frame associated with the timer expiration.
- 10. A communication system comprising a control system and a communication interface that cooperate to provide a physical layer and a link control layer adapted to:
 - a) detect a failed attempt to transmit a frame at the physical layer;
 - b) send a message from the physical layer to the link control layer to indicate that the failed attempt to transmit the frame has been detected; and

- c) upon receipt of the message, send a retransmission message from the link control layer to a sender to cause the sender to retransmit data associated with the frame.
11. The communication system of claim 10 wherein the physical layer receives at least a portion of the frame and determines at least a portion of the data associated with the frame is either unrecoverable or corrupted.
12. The communication system of claim 10 wherein the link control layer implements a Radio Link Protocol (RLP) using an RLP entity associated with an application.
13. The communication system of claim 12 wherein the frame is a physical layer frame encapsulating data represented by an RLP frame and the link control layer generates the retransmission message to include identification for one of the group consisting of a recently received RLP frame and recently received data such that the sender can identify data or an RLP frame to retransmit.
14. The communication system of claim 10 wherein the frame is a physical layer frame and further comprising a sender control system and a communication interface cooperating to provide a physical layer and a link control layer for the sender to:
- a) receive the retransmission message at a link control layer of the sender;
 - b) determine data or a link control layer frame to retransmit; and
 - c) retransmit the data or link control layer frame requiring retransmission.
15. The communication system of claim 10 wherein the message is a primitive indicative of a failed attempt to receive frames in the physical layer.

16. The communication system of claim 10 wherein retransmission message is an acknowledgement message.
17. The communication system of claim 10 wherein the frame is a physical layer frame and further comprising a sender control system and a communication interface cooperating to provide a physical layer and a link control layer for the sender to:
 - a) send link control layer frames over a wireless communication channel to the receiver via physical layer frames from the sender;
 - b) set a timer upon transmitting each of the link control layer frames from the sender; and
 - c) reset the timer upon confirmation that the link control layer frames were received or a subsequent link control layer frame is sent.
18. The communication system of claim 17 wherein when the timer for one of the link control layer frames expires, the link control layer of the sender sends one of the group consisting of a request message to the link control layer of the receiver requesting identification of a last portion of data or control layer frame received by the link control layer of the receiver and data or a link control layer frame associated with the timer expiration.
19. A computer readable medium comprising software to provide instructions to allow a physical layer and a link control layer to cooperate to:
 - a) detect a failed attempt to transmit a frame at the physical layer;
 - b) send a message from the physical layer to the link control layer to indicate that the failed attempt to transmit a frame has been detected; and
 - c) upon receipt of the message, send a retransmission message from the link control layer to a sender to cause the sender to retransmit data associated with the frame.

20. The computer readable medium of claim 19 wherein the physical layer receives at least a portion of the frame and determines that at least a portion of the data associated with the frame is either unrecoverable or corrupted.
21. The computer readable medium of claim 19 wherein the link control layer implements a Radio Link Protocol (RLP) using an RLP entity associated with an application.
22. The computer readable medium of claim 21 wherein the frame is a physical layer frame encapsulating data represented by an RLP frame and the link control layer generates the retransmission message to include identification for one of the group consisting of a recently received RLP frame and recently received data such that the sender can identify data or an RLP frame to retransmit.
23. The computer readable medium of claim 19 wherein the frame is a physical layer frame and further comprising a sender control system and a communication interface cooperating to provide a physical layer and a link control layer for the sender to:
 - a) receive the retransmission message at a link control layer of the sender;
 - b) determine data or a link control layer frame to retransmit; and
 - c) retransmit the data or link control layer frame requiring retransmission.
24. The computer readable medium of claim 19 wherein the message is a primitive indicative of a failed attempt to receive frames in the physical layer.
25. The computer readable medium of claim 19 wherein retransmission message is an acknowledgement message.

26. The computer readable medium of claim 19 wherein the frame is a physical layer frame and further comprising a sender control system and a communication interface cooperating to provide a physical layer and a link control layer for the sender to:
- a) send link control layer frames over a wireless communication channel to the receiver via physical layer frames from the sender;
 - b) set a timer upon transmitting each of the link control layer frames from the sender; and
 - c) reset the timer upon confirmation that the link control layer frames were received or a subsequent link control layer frame is sent.
27. The computer readable medium of claim 26 wherein when a timer for one of the link control layer frames expires, the link control layer of the sender sends one of the group consisting of a request message to the link control layer of the receiver requesting identification of a last portion of data or control layer frame received by the link control layer of the receiver and data or a link control layer frame associated with the timer expiration.